

In the Claims:

The status of the claims is as follows:

1-16. (Canceled)

17. (Previously Presented) A magnetic storage apparatus comprising:

at least one magnetic recording medium; and

at least one head adapted to apply a magnetic field to the magnetic recording medium;

said magnetic recording medium including:

a first magnetic layer;

a second magnetic layer; and

a non-magnetic coupling layer provided between said first magnetic layer and said second magnetic layer so that said first and second magnetic layers are exchange coupled;

wherein, during a recording process, the magnetic field applied to the recording medium is limited to a range such that magnetizations of said first magnetic layer and said second magnetic layer are maintained in either a first antiparallel state or a second antiparallel state, without entering into a parallel state, whereby in said second antiparallel state the magnetizations of said first magnetic layer and said second magnetic layer are reversed, but still antiparallel, relative to the magnetizations in said first antiparallel state; and

wherein said first magnetic layer has an exchange coupling field H_{ex1} that is larger than both a coercivity H_{c1} of the first magnetic layer and a coercivity H_{c2} of the second magnetic layer.

18. (Original) The magnetic storage apparatus as claimed in claim 17 further comprising:

a coupling intensifying region, provided near a boundary of said non-magnetic coupling layer and at least one of said first and second magnetic layers, wherein said coupling intensifying region intensifies an exchange coupling strength between said first magnetic layer and said second magnetic layer.

19. (Original) The magnetic storage apparatus as claimed in claim 17, further comprising:

a first coupling intensifying region, provided near a boundary of said first magnetic layer and said non-magnetic coupling layer, wherein said first coupling intensifying region intensifies an exchange coupling strength between said first magnetic layer and said second magnetic layer; and

a second coupling intensifying region, provided near a boundary of said second magnetic layer and said non-magnetic coupling layer, wherein said second coupling intensifying region intensifies the exchange coupling strength between said first magnetic layer and said second magnetic layer.

20. (Previously Presented) The magnetic storage apparatus as claimed in claim 18, wherein the coupling intensifying region includes a material dispersed within a surface portion of at least one of said first and second magnetic layers at the boundary of said non-magnetic coupling layer and at least one of said first and second magnetic layers.

21. (Canceled)

22. (Canceled)

23. (Previously Presented) The magnetic storage apparatus as claimed in claim 17, wherein said magnetic recording medium includes:

a recording surface; and

a plurality of unit recording portions, provided on said recording surface, having boundaries which are separated from adjacent unit recording portions,

wherein each of said plurality of unit recording portions has a stacked structure formed by said first magnetic layer, said non-magnetic coupling layer and said second magnetic layer.

24. (Previously Presented) A magnetic storage apparatus comprising:

at least one magnetic recording medium; and

at least one head adapted to apply a magnetic field to the magnetic recording medium,

said magnetic recording medium comprising:

a first magnetic layer;

a second magnetic layer;

a non-magnetic coupling layer provided between the first magnetic layer and the second magnetic layer so that the first and second magnetic layers are exchange-coupled and the first magnetic layer has an exchange coupling field H_{ex1} that is larger than both a coercivity H_{c1} of the first magnetic layer and a coercivity H_{c2} of the second magnetic layer;

a recording surface; and

a plurality of unit recording portions, provided on said recording surface, having boundaries which are separated from adjacent unit recording portions,

wherein each of said plurality of unit recording portions has a stacked structure formed by said first magnetic layer, said non-magnetic coupling layer and said second magnetic layer.

25. (Canceled)